UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,111	03/27/2001	Kirk P. Seward	IL-10625	4312

7590 06/15/2004

Alan H. Thompson
Assistant Laboratory Counsel
Lawrence Livermore National Laboratory
P.O. Box 808, L-703
Livermore, CA 94551

EXAMINER	
RHEE, JANE J	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/819,111	SEWARD ET AL.	
	Examiner	Art Unit	
	Jane J Rhee	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-35* is/are pending in the application.

4a) Of the above claim(s) *7,13,23-27 and 29-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6,8-12,14-22,28,32-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Withdrawn Rejections

1. The 35 U.S.C. 103 (a) rejection of claims 2-6,12,14-22,28,34-35 over Phan et al. in view of Maynard has been withdrawn due to applicant's amendment in response 3/24/2004.

2. The 35 U.S.C. 103(a) rejection of claims 32-33 over Phan et al. and Maynard in view of Lee et al. has been withdrawn due to applicant's amendment in response 3/24/2004.

Response to Arguments

3. Applicant's arguments with respect to claims 2-6,8-12,14-22,28,32-35 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 recites the limitation "said portion" in line 9 and 11. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 11 recites the limitation "said device" in line 12. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 2-5,8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Phan et al. (5674242).

Phan et al. discloses a first unit (figure 6a number 86) and a second unit (figure 6a number 84) comprising a first and second quantity of shape memory alloy and a first and second quantity of shape memory polymer wherein the first and second shape memory alloy having a longitudinally extending coiled configuration with more than one wrap (figure 2c number 34) and the first and second shape memory comprises a cylinder (figure 2b number 32 and 34, figure 2d number 32 and 34), wherein the portion of the apparatus is positioned in the first and second unit such that changes in transition of the shape memory alloy causes the first and second unit to change position (col. 2 lines 34-42). Phan et al. discloses that the first and second shape memory alloy is embedded or positioned within the first and second shape memory polymer respectfully (figure 2b number 32,34). Phan et al. discloses that the coil configuration of the first and second unit is longitudinally compressed and retained in the first and second shape memory polymer respectfully so as to define a hollow tube cylinder with a wall surface having the coil configuration embedded in the wall surface thereof (figure 2d number 34,32). Phan et al. discloses that the coil configuration of the first and second unit has an axis coaxial with an axis of the hollow tube cylinder (figure 2d number 34). Phan et

al. discloses a plurality of additional structures each having a longitudinally extending coiled configuration of shape memory alloy located within the shape memory polymer comprising a cylinder (figure 2c numbers 34,32) wherein each coil configuration has a different configuration and the plurality of structures are in a series configuration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 11-12,14-22,28,34-35 rejected under 35 U.S.C. 103(a) as being unpatentable over Phan et al. in view of Maynard (5405337).

Phan et al. discloses a structure having an axis, the structure including a quantity of shape memory alloy and a quantity of shape memory polymer (figure 2b number 32 and 34) wherein the quantity of shape memory polymer is a cylinder (figure 2c number 32), wherein the shape memory alloy is positioned in the structure generally parallel to the axis and spaced from the axis (figure 2c number 34 and 32), wherein the shape memory alloy is positioned in the device (figure 2c number 34). Phan et al. discloses that the quantity of shape memory alloy has a ribbon configuration (figure 2c number 34).

Phan et al. discloses that the quantity of cylindrical shape memory polymer has a closed cylinder configuration (figure 1a number 22). Phan et al. discloses a quantity of shape memory alloy that has a coiled spring configuration wherein the quantity of shape

memory polymer is a cylinder and wherein the coiled spring configuration is embedded in the shape memory polymer (figure 2c number 34 and 32). Phan et al. discloses that the quantity of shape memory alloy has a closed tubular configuration located within the shape memory polymer (figure 1a numbers 18 and 22 col. 11 line 18).

Phan et al. discloses an articulated tip or device comprising; a member constructed of shape memory polymer (figure 2b number 32), wherein, the shape memory polymer comprises a cylinder (figure 2b number 32) and the cylinder has a cylinder central axis, the member including a shape memory alloy with a shape memory alloy axis located in or adjacent to the member in a position wherein the shape memory axis is offset from the cylinder central axis constructed of shape memory polymer (figure 5c number 34), and means for selectively heating the members to cause a change in configuration thereof, whereby the change in configuration results in reversible position thereof (col. 2 lines 34-42). Phan et al. discloses that the shape memory alloy is located in openings in the shape memory polymer (figure 4c number 54 and 52). Phan et al. discloses that the shape memory alloy is composed of a plurality of section embedded in the tubular configuration (figure 4c number 52 and 54).

Phan et al. fail to disclose that changes of the shape memory alloy causes a portion of the device to bend. Phan et al. fail to disclose that the quantity of shape memory alloy is composed of a plurality of shape memory alloy strips. Phan et al. fail to disclose that the shape memory alloy is composed of a plurality of strips, and wherein the strips located in a wall surface of the shape polymer. Phan et al. fail to disclose that the plurality of strips are in the wall surface in a direction selected from the group

consisting longitudinal and radial with respect to an axis of the configuration. Phan et al. fail to disclose that the plurality of strips are in a spaced longitudinal relationship. Phan et al. fail to disclose that the plurality of strips are located spaced radial relationships.

Maynard teaches that the changes of the shape memory alloy causes a portion of the device to bend (col. 6 lines 13-21) for the purpose of executing extremely dexterous maneuvers in three dimensional space (col. 6 lines 39-42). Maynard teaches that the quantity of shape memory alloy is composed of a plurality of shape memory alloy strips wherein the strips are located in a wall surface of the shape polymer (figure 3a), in a direction selected from the group consisting longitudinal and radial with respect to an axis of the configuration (figure 3a number 105) for the purpose of being able to controllably move a catheter tube or bendable element any direction in three dimensional space (col. 3 lines 28-31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide Phan et al. with the changes of the shape memory alloy causes a portion of the device to bend in order to execute extremely dexterous maneuvers in three dimensional space (col. 6 lines 39-42) as taught by Maynard.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided Phan et al. with the quantity of shape memory alloy that is composed of a plurality of shape memory alloy strips wherein the strips are located in a wall surface of the shape polymer, in a direction

selected from the group consisting longitudinal and radial with respect to an axis of the configuration in order to controllably move a catheter tube or bendable element any direction in three dimensional space (col. 3 lines 28-31) as taught by Maynard.

8. Claims 32-33 rejected under 35 U.S.C. 103(a) as being unpatentable over Phan et al. and Maynard in view of Lee et al. (6059815).

Phan et al. discloses a plurality of units each having a coiled configuration of shape memory alloy and a cylindrical configuration of shape memory polymer, the units being connected in series wherein the coiled configuration has a different configuration (figure 2c number 32,34). Phan et al. and Maynard fail to disclose that the plurality of units each having a coiled configuration of shape memory alloy and a cylindrical configuration of shape memory polymer is connected to a light source via a plurality of optical fibers in a catheter and light control mechanism. Lee et al. teaches a laser light source via a plurality of optical fibers in catheter and light control mechanism (col. 6 line 35) for the purpose of heating means for shape memory polymer release mechanisms (col. 3 lines 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided Phan et al. with a laser light source via a plurality of optical fibers in catheter and light control mechanism in order to provide heating means for shape memory polymer release mechanisms (col. 3 lines 1-2) as taught by Lee et al.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jane J Rhee whose telephone number is 571-272-1499. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser Ahmad can be reached on 571-272-1487. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jane Rhee
June 3,2004

NASSER AHMAD
PRIMARY EXAMINER 6/4/04